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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JAN. 31, 1948

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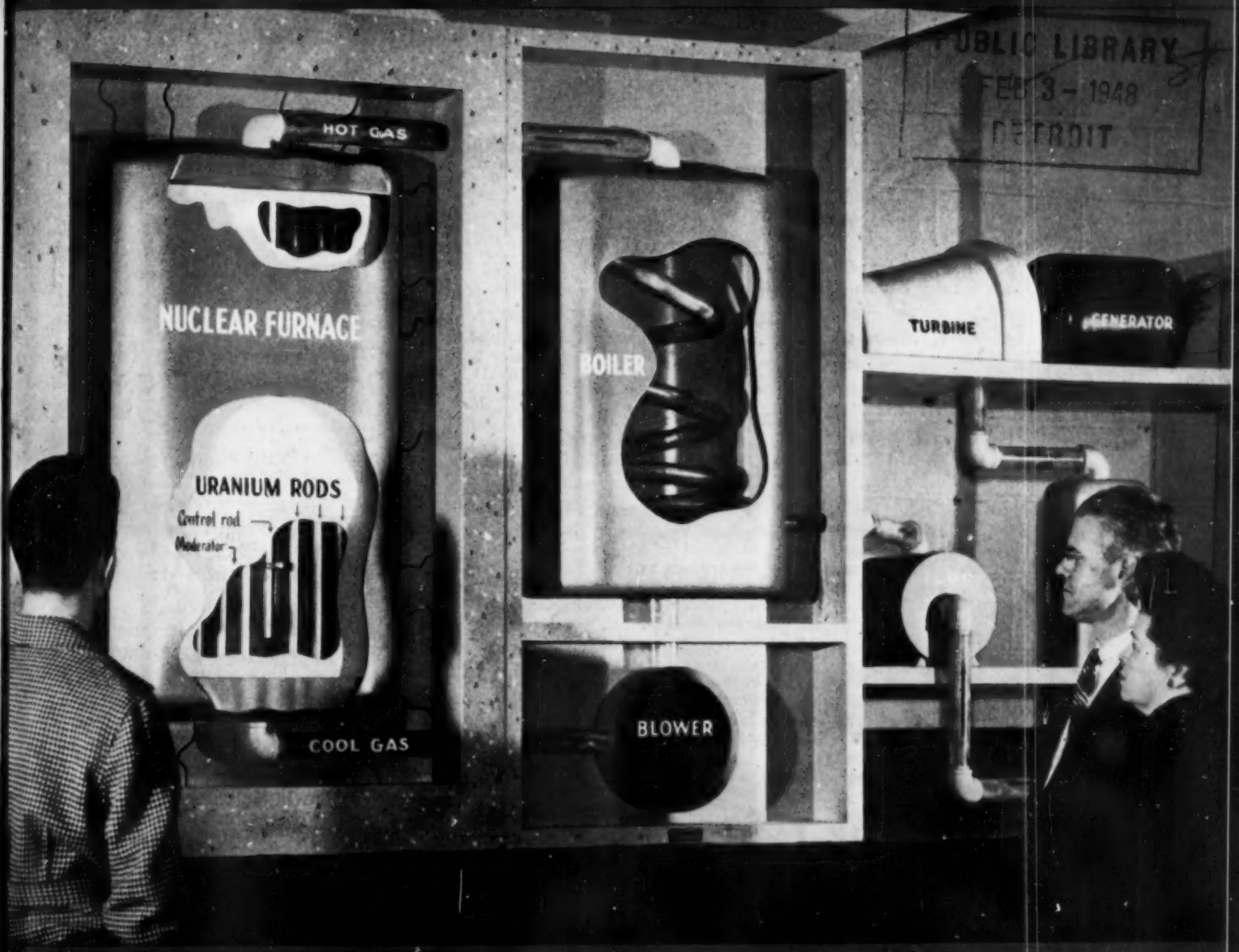

Atomic Power?

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A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

40 Winners Are Selected

Eight girls and 32 boys (proportion determined by ratio of boys and girls entering the contest) are being invited to Washington, D. C., for an all-expense trip February 27 through March 2, 1948, to attend the Science Talent Institute. Here one boy and one girl will be awarded $2,400 Westinghouse Grand Science Scholarships. Eight winners will be awarded $400 Westinghouse Science Scholarships and $3,000 additional in scholarships will be awarded at the discretion of the judges.

	ARIZONA
Phoenix	Coe, Elmon Lee 16 North Phoenix High School
	CALIFORNIA
Glendale	Dibble, William Edwin 17 Herbert Hoover High School
Los Angeles	Childress, Patricia Lee 17 Alexander Hamilton High School
Van Nuys	Johnston, Alan Robert 16 Van Nuys High School
	COLORADO
Denver	Berry, Richard Stephen 16 East High School
	CONNECTICUT
Greenwich	Wilcox, Charles Frederick, Jr. 17 Greenwich High School
	ILLINOIS
Chicago	Decker, Charlotte Elizabeth 17 Senn High School
Evanston	Kende, Andrew Steven 15 Evanston Township High School
Oak Park	Geller, David Melville 17 Oak Park Township High School
	INDIANA
Terre Haute	Sawyer, Millicent Margaret 17 Wiley High School
	MASSACHUSETTS
Boston	Yphantis, David Andrew 17 Public Latin School
	Zisk, Stanley Harris 16 Public Latin School
	MICHIGAN
Lansing	Poindexter, Edward Haviland 17 J. W. Sexton High School
	MISSOURI
St. Louis	Rodemich, Eugene Richard 16 Beaumont High School
	NEW JERSEY
New Brunswick	Camamis, George 17 New Brunswick Senior High School
Rahway	Breslow, Ronald Charles 16 Rahway High School
	NEW YORK
Brooklyn	Howett, Gerald Leonard 16 Abraham Lincoln High School
	Schlicta, Paul Joseph 18 Brooklyn Preparatory School
	Teager, Herbert Martin 17 Midwood High School
Floral Park	Jamieson, John Burgess 17 Sewanhaka High School
Flushing	Mazo, Robert Marc 17 Flushing High School
Forest Hills	Baraff, Gene Allen 17 Forest Hills High School
	Blumenheim, Ursel Joyce 16 Forest Hills High School
	Wolff, Barbara Claire 17 Forest Hills High School
New York	Kohn, Kurt William 17 Bronx High School of Science
	Scheider, Walter Julius 17 Bronx High School of Science
	LeSchack, Alan Richard 16 Stuyvesant High School
	Martin, Paul 16 Stuyvesant High School
	Rayna, Gerhard 17 Stuyvesant High School
Rockville Centre	Maurer, Laura Caroline 17 South Side High School
Staten Island	Lubin, Michael David 16 Tottenville High School
	OHIO
Canton	Miller, Jerry Blair 17 Lincoln High School
	Rowe, Nancy Jean 16 Lincoln High School
Liberty Center	Rigal, R. Daniel 17 Liberty Center Village High School
Logan	Schaad, Lawrence Joseph 17 Logan High School
	OREGON
Springfield	Peacock, Roy Norman 17 Springfield Union High School
	PENNSYLVANIA
Pittsburgh	Alexeff, Igor 17 Mt. Lebanon High School
	SOUTH DAKOTA
Sioux Falls	Richardson, James Wyman 17 Washington High School
	WISCONSIN
Brodhead	Gilbert, Marjorie Ann 17 Brodhead High School
Madison	Koehler, George Edgar 17 West High School

COMET 1947 n—Although no longer visible to the naked eye, this great comet is still being followed with interest by astronomers.

ASTRONOMY

Comet 1947 n Was Not "Double-Headed" Comet

➤ COMET 1947 n, that spectacular comet seen in the southern skies by many observers, was not a "double-headed" comet. Instead of actually splitting into two parts, a second faint nucleus developed inside the head of the comet and gradually receded from the primary nucleus.

So far, at least, the creation of this second nucleus has not lead to any disruption of the cometary mass, Dr. J. S. Paraskevopoulos, superintendent of Harvard's South African Station, states. The double nucleus was observed as early as December 10 by Dr. W. H. van den Bos of Union Observatory, Johannesburg, South Africa.

The double nucleus and its many tails made Comet 1947 n particularly interesting, both to amateurs and astronomers. Multiple tails have been observed in many bright comets, but two nuclei are quite rare and of greater significance.

Since its discovery early in December by an unnamed observer on a ship at sea, this bright comet has faded considerably. It can no longer be seen with the naked eye and the grandeur of its tails is gone.

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GENERAL SCIENCE

Future Leaders in Science

Eight girls and 32 boys have been invited for an all-expense visit to Washington to compete in the finals for scholarships totaling $11,000.

➤ FORTY future leaders in American science—eight girls and 32 boys—have been invited for a five-day, all-expense visit to Washington. While at the annual Science Talent Institute, they will undergo final selection for the Westinghouse Science Scholarships in the Seventh Annual Science Talent Search conducted by Science Clubs of America, administered by Science Service.

The 40 trip-winners were chosen by a panel of judges after a nation-wide competition in which top-ranking seniors in all the public, parochial and private high schools in the continental United States were invited to participate. Entrants, representing every state in the Union, totaled 16,412, of whom 3,161 completed the stiff science aptitude examination, submitted recommendations and scholarship records and wrote an essay on "My Scientific Project."

At the end of their five-day stay in Washington, Feb. 27 through March 2, the judges will announce the winners of the scholarships. One girl and one boy will each receive a $2,400 Westinghouse Grand Science Scholarship ($600 a year for four years). Each of eight additional winners will get a $400 Westinghouse Science Scholarship ($100 a year for four years). In addition, $3,000 in Westinghouse Science Scholarships will be awarded at the discretion of the judges.

Have Choice of Schools

Winners of these scholarship awards may enter any college, university or technical school of their choice.

Chosen without regard to geographic distribution, the 40 trip-winners come from 30 localities in 16 states. One state, South Dakota, this year sends a winner to Washington for the first time. This brings to 35 the total of states that have been represented by winners.

Five high schools in the United States have produced more than one winner each this year. Five of the boys will come from New York City: three from Stuyvesant High School and two from the Bronx High School of Science. Forest Hills (N. Y.) High School will send two girls and one boy, and Lincoln High School in Canton, Ohio, will send one girl and one boy. There will be two boys from the Public Latin School in Boston.

A number of high schools throughout the country represented in this year's list of Science Talent Search winners have produced one or more winners in previous competitions. There have been nine from the Bronx High School of Science, and five from Stuyvesant High School. There have been three each from Herbert Hoover High School at Glendale, Calif., West High School at Madison, Wis., and Forest Hills (N. Y.) High School; two each from Alexander Hamilton High School at Los Angeles, Evanston Township (Ill.) High School and Oak Park Township (Ill.) High School, and one each from Midwood High School at Brooklyn, N. Y., and Sewanhaka High School at Floral Park, N. Y.

All of the winners live at home and attend their local or nearby public, parochial or private high schools.

High Standing in Class

Half of the Science Talent Search trip winners rank first, second or third in their graduating classes, which range in size from 31 to 750 students. Approximately 62% of the winners' fathers and 52% of their mothers attended colleges.

These trip-winning students are not in the "greasy grind" category; most of them have a wide variety of outside activities. At least eight are presidents or other officers in science clubs affiliated with Science Clubs of America.

Many of the fortunate 40 have already chosen the lines of study and research they wish to pursue. Theoretical physics attracts 12; two hope to enter medicine; nine intend to take up chemistry, either for research or for engineering applications; four want to go into biochemistry. Others indicate interest in mathematics, astronomy, engineering, genetics and biology.

Judges of the Science Talent Search are: Dr. Harlow Shapley, Director of the Harvard College Observatory and president of Science Service; Dr. Harold A. Edgerton and Dr. Steuart Henderson Britt, psychologists of New York City, and Dr. Rex E. Buxton, psychiatrist of Washington D. C. Drs. Edgerton and Britt design the Science Aptitude Examination each year for the Science Talent Search.

In addition to the 40 trip-winners who will attend the Science Talent Institute in Washington, an Honorable Mentions list of 260 in the Seventh Annual Science Talent Search will be announced. These high-ranking contestants will be recommended to colleges and universities for their science aptitude. If they are as fortunate as those previously included in the Honorable Mentions list, they will receive offers of scholarships from many institutions of higher education.

Activities of Past Winners

Most of the winners in the six Science Talent Searches held since 1942 are now students in colleges and universities where they are preparing themselves for scientific careers. Many have already completed the four-year course leading to the bachelor's degree, and six will soon become Ph.D.'s. A few are already engaged in full-time jobs in industry or on university teaching or research staffs. None of the 240 previous winners is more than 24 years old.

Scholarships are provided and the Science Talent Search made financially possible by the Westinghouse Educational Foundation, an organization endowed by the Westinghouse Electric Corporation, for the purpose of promoting education and science.

Through an arrangement with the State Academies of Science, 11 states are conducting state Science Talent Searches concurrently with the national competition. In these 11 states all entries in the national Science Talent Search will be turned over to state judging committees. From their entries they will choose state winners and award scholarships to various colleges and universities. Cooperating states are: Alabama, Georgia, Illinois, Indiana, Iowa, Louisiana, Minnesota, Montana, Pennsylvania, Tennessee and Virginia.

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ARCHAEOLOGY

African Expedition Finds Fossils of Late Stone Age

➤ POLISHED stone implements of Late Stone Age men, together with fossil animals, have been found by the Egyptian party of the University of California African Expedition along the shores of a now-dry Neolithic lake.

The finding, made by Dr. S. A. Huzayyin, archaeologist of Farouk I University and a member of the expedition

staff, was reported at the expedition's headquarters at Kom Oshim near Cairo in the Faiyum Desert.

The recovery of Stone Age artifacts together with fossil animals will make it possible to reconstruct the life and conditions of this period, and possibly necessitate a redating of the lake, Dr. Huzayyin said.

The fossil specimens include hippopotamus, wart hog, gazelle, large antelope, elephant, crocodile, turtle, and fish.

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GENERAL SCIENCE

17 Expeditions Planned

Scientists of the Chicago Natural History Museum will go to Bermuda to study sea life, to Burma to collect birds, to Peru and Bolivia to collect plants.

➤ STRANGE creatures from more than a mile under the surface of the ocean off Bermuda, fossils of invertebrates 450,000,000 years old from the mountains of Pennsylvania, birds from Burma and insects from Guatemala are a few of the prizes which scientists from the Chicago Natural History Museum plan to collect this year.

In all, 17 expeditions at locations ranging from Africa to Arkansas and from Alaska to Burma will make studies and collect specimens.

The three-month Bermuda Deep-Sea Expedition will start work June 1, under the joint sponsorship of the museum and the Bermuda Biological Station for Research, Inc., St. Georges, Bermuda. The "Caryn," a 98-foot ketch loaned to the Bermuda station by the Oceanographic Institution of Woods Hole, Mass., will be used by the expedition to study sea life at depths of from 8,000 to 12,000 feet.

Loren P. Woods, curator of the museum's division of fishes, will be leader of the expedition, with Dr. Dugald E. S. Brown heading the Bermuda group.

Another large expedition will be the museum's archaeological expedition to the Southwest, where a large staff will continue excavations of prehistoric Indian sites. Dr. Paul S. Martin, chief curator of anthropology, will lead.

The Rush Watkins Southeast Asia Expedition will leave Chicago in September to collect birds in Burma. Mr. Watkins, a Chicago businessman, and Dr. Austin L. Rand, the museum's curator of birds, will conduct the work. Melvin A. Traylor, Jr. museum associate, will head another ornithological expedition which will collect Mexican birds in the Mt. Orizaba region, beginning in June.

Eugene S. Richardson, curator of invertebrate fossils, will collect invertebrates of the Ordovician period in the mountains of Pennsylvania, while Dr. Rainer Zangerl, curator of fossil reptiles, will conduct a search for specimens of prehistoric reptiles and amphibians in the Alcova formation of central Wyoming.

Four botanical groups will be in the field. Dr. Hugh C. Cutler, curator of economic botany, will spend several weeks next month in Cuba with Dr. B. E. Dahlgren, curator emeritus of botany, who is studying palm genetics. In April, Dr. Cutler will fly to Peru and Bolivia to collect plant specimens in those countries. Paul C. Standley, curator of the museum's herbarium will collect botanical specimens in Central America, beginning in September, while Dr. Francis Drouet, curator of cryptogamic botany, will at the same time collect mosses, seaweeds and other specimens in coastal areas of the Gulf of Mexico from Louisiana to Florida.

Harry Hoogstraal, assistant curator of insects, is in Africa with the University of California expedition, and Rupert L. Wenzel, assistant curator of insects, will leave in April for Guatemala where he will collect insects for the museum.

Mammal specimens from the state of Arkansas will be studied by Colin C. Sanborn, curator of mammals, starting in March, while the assistant curator of mammals, Philip Hershkovitz, will leave in October for Colombia to begin a year of mammal collecting in that country.

Dr. Robert Kriss Wyant, curator of economic geology, and Harry Changnon, curator of exhibits, will collect ores in the Black Range Mountains, N. Mex., and Dr. Sharat K. Roy, chief curator of geology, will continue his field study in the Adirondack Mountain areas of New York, New Hampshire and perhaps Massachusetts.

Material for use in a habitat group of the precious sea otter will be collected in Alaska this summer by Frank Wonder, staff taxidermist.

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TECHNOLOGY

Short Length Nylon Fibers Make Wool-Like Garments

➤ LADIES' stockings, more sheer than any you have seen, and warm, wool-like socks for men, both made of nylon, were displayed at the DuPont plant in Seaford, Del.

Other all-nylon products shown were: woolly sweaters, soft blankets, upholstery and felt.

Some of these new nylon developments are made possible by cut-to-length, staple nylon. The synthetic fibers are stretched, crimped and cut into lengths of two or three inches. Instead of the sheer fabrics such as are produced from

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long, continuous-filament nylon, the short length fibers can be used to create soft, warm garments which resemble wool. This process is opening up a vast new field for synthetic fiber. Used alone or blended with wool, silk or rayon, it is giving greater variety in fabrics and more durable ones.

Both the sheerest of sheer ladies' stockings and woolly, nylon men's socks have been produced only experimentally. The sheerest stockings are 10 denier, compared with 15 or 20 for most nylons.

Nylon itself is still in its infancy. It was first introduced to the public less than ten years ago. Not in the form of stockings but as toothbrush bristles was it first placed on the market. Nylon stockings did not appear until May 15, 1940.

Strength along with elasticity are nylon's two most important properties. Today, this fiber, a favorite with fastidious ladies, is proving its popularity in many fields. Polo shirts, jockey caps and football pants are made of it. Nurses find that uniforms of nylon save laundry bills. Nylon linings in fur coats outwear the fur. The fabric makes excellent laundry nets. Blouses, slips, panties and foundation garments are only a few of the newly-approved uses of this synthetic fiber, that in less than a decade has begun to play such a vital role in the fabric industry.

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MEDICINE

Plague Patients Saved

Streptomycin was given to five dying patients after other treatment proved futile. First sign of improvement was seen within 36 hours.

➤ FIVE patients dying of plague, one of the most fatal of all epidemic diseases, are alive and well today, thanks to streptomycin. They are living proof of the hopes held by medical scientists that the great disease conqueror from an earth mold would prove effective against this scourge of the centuries.

The patients were victims in a plague outbreak in the Madras Presidency, India. Their rapid recoveries under streptomycin treatment are reported by the Anantapur medical officer, P. V. Karamchandi, and the medical officer of the Hindupur Plague Hospital, K. Sundar Rao, in the medical journal, *Lancet*, (Jan. 3.)

The five young patients had temperatures as high as 106.6 degrees Fahrenheit, swollen glands, were semi-conscious and had a dangerously low rate of breathing. Plague germs were discovered upon puncture of the enlarged glands.

Sulfa drugs, found partly effective in checking plague in China, were given to the first three of the patients but did not help. So streptomycin was tried. Within 36 hours after the start of this treatment the patients became conscious and recovery followed rapidly.

"Streptomycin appears to be a potent drug for the treatment of human plague," the Indian medical officers report.

No bad effects were observed from the drug.

The lowly laboratory mouse first pointed the way to check-mating the Black Death. In the early part of 1947, Dr. Karl Meyer of the University of California showed that streptomycin controlled pneumonic plague, the most deadly form of the disease, in 90% of mice. But its effect on human plague patients remained to be proved.

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NUCLEAR PHYSICS

Atomic Energy Exhibit Biggest of Its Kind in U. S.

See Front Cover

➤ JOHN Q. PUBLIC is invited to view the biggest atomic energy exhibit ever provided the American people at the American Museum of Natural History in New York City.

Sponsored by the Brookhaven National Laboratory to promote individual understanding of nuclear science developments, the exhibit utilizes models, demonstrations, talks, movies, large panel diagrams presenting fundamental atomic facts, photomurals and other devices to show the great values of nuclear energy in scientific research.

A model power plant, shown on the cover of this week's SCIENCE NEWS LETTER, demonstrates how an atomic pile may some day be used to generate electric power. Nuclear fission releases great

MAKES YOUR HAIR STAND ON END—By touching the dome of this model Van de Graaff electrostatic generator, used in nuclear processes, the young man on the right got a shock of static electricity which made his hair rise vertically. This is one of several scientific instruments being shown at the atomic energy exhibit.

heat which may be transformed into steam to drive electric generating machinery.

The exhibit, which opened on Jan. 21, will remain in New York until April 5 and then be displayed in other cities in the Northeastern and Middle Atlantic states.

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MEDICINE

Early Attack Might Cure

Possibility of curing Hodgkin's disease and lymphosarcoma depends on early diagnosis and aggressive treatment before the diseases have spread.

➤ EARLY diagnosis and early aggressive treatment might lead to cure of Hodgkin's disease and lymphosarcoma, at least in some cases, Dr. Lloyd F. Craver of Memorial Hospital, New York, declares in the *Journal of the American Medical Association* (Jan. 24).

He cites the case of five patients with Hodgkin's disease treated at Memorial Hospital who survived five to 11 years, two patients treated in England with survivals of 10 and 12 years respectively, and survival rates in lymphosarcoma of from 23 to 52 out of 100 patients.

The possibility of curing these two diseases, which hitherto have been regarded as incurable, depends primarily on whether they start from a single spot in the body, as cancer does, or from many. If they start from only one spot, early treatment should make a cure possible. The evidence for this possibility, Dr. Craver states, is accumulating.

In Hodgkin's disease, he reports, it has long been his experience that outstanding among those cases with long survivals and long periods of freedom from disease have been those in which the disease has been treated fairly aggressively while it is still early and localized.

Treatment of such early cases consists in removal, by operation, of the involved lymph gland or node, and X-ray treatment.

Chemical treatment in the form of nitrogen mustards and radioactive isotopes of phosphorus, sodium, manganese or gold have so far been useful only for relieving symptoms. While the nitrogen mustards sometimes give striking results in Hodgkin's disease the improvement is "disappointingly brief" in many cases.

With his plea for early recognition and treatment of Hodgkin's disease and lymphosarcoma, Dr. Craver gives some early signs.

An enlarged lymph node or gland, for example those in the neck which are frequently thought to be the result of a cold or sore throat, should be considered a danger signal if it does not subside in three weeks.

Cough, a feeling of pressure under the breast bone, fullness at the base of the neck, puffiness of the eyes on arising, wheezing and labored breathing are symptoms calling for careful examination to make sure they are not due to Hodgkin's disease or lymphosarcoma.

A solitary lump in a woman's breast may not be a cyst or a cancer but the first sign of lymphosarcoma.

A slightly thickened pink or purplish plaque in the skin, especially of the scalp, may be a first sign of lymphosarcoma.

A thickening in and about the tear gland and the conjunctiva of the eyes, a change in bowel habit or other stomach and intestinal symptoms, and bone symptoms are other danger signals Dr. Craver gives for Hodgkin's disease and lymphosarcoma.

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CHEMISTRY

Russian Tip on Vitamin May Lead to New Industry

➤ DESPITE iron curtains and diplomatic impasses, useful scientific information still circulates from nation to nation. Russian scientists are credited by chemists of the U. S. Department of Agriculure with a discovery that may mean a new million-dollar industry in this country.

The Russians, states Dr. L. B. Howard, chief of the Bureau of Agricultural and Industrial Chemistry, reported discovery of large amounts of ascorbic acid, or vitamin C, in green walnuts. Government chemists, quickly following up this lead, found the vitamin not only in green English walnuts but in the discarded hulls of ripe nuts, and developed a method for extracting it in pure crystalline form.

There are enough walnut hulls in California after each harvest to yield about 125,000 pounds of recoverable ascorbic acid, worth nearly $1,500,000 at present prices. Further work is now in progress to arrive at an economic evaluation of walnut hulls as a commercial source of the vitamin.

English walnuts, incidentally, are not English but Persian in origin. They are more extensively grown now in California than they ever were in ancient Persia.

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ASTRONOMY

Astronomers Take First Peek With Giant Telescope

➤ A PEEK deeper into cosmic space has been granted astronomers by the giant telescope of Palomar. Many such preliminary "looks" into space beyond the reach of all other telescopes will be necessary as final adjustments are made on the new 200-inch telescope. Officials hope that the world's largest telescope can begin work on its important research program by June.

Test observations, both visual and photographic, have been made to try the mirror rather than to study some heavenly object of particular importance. A great deal of work remains to be done in adjusting the support system, the driving mechanism and so on. Some of the auxiliary mirrors have not yet been completed or installed.

The first project to be assigned the telescope atop Mount Palomar has not yet been decided. It will concern, in general, the relative abundance of chemical elements in stars, the structure and behavior of the universe as a whole, or it may possibly be an attempt to get a snap shot of Mars. This latter, though of great popular interest, is considered the least important.

The three respects in which this telescope is expected to surpass all others are: 1. resolving power. 2. dispersion. 3. space penetration. The first of these would lead to further evidence concerning the canals of Mars; the second to more information about the abundance of the elements in the universe; the third to knowledge about the distribution of the galaxies, those systems of billions of stars like the Milky Way system of which the earth is a part.

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At least 12 *gas-turbine* electric locomotives are being designed in America, Great Britain, Switzerland and France.

TESTING GI SHOES—Longer-wearing footwear for civilians and Army is expected from the experiments made at the shoe track at Camp Lee, Va. Here a soldier is shown in the process of testing new shoes on mud and log traction slides. As a result of this program a type I leather-soled shoe was found early in the war to last 150 miles while a recent type III shoe, using synthetic rubber material in the sole, has a life expectancy of 2,500 miles.

GEOLOGY

Find Bikini Is Very Old

It is estimated to be more than 20,000,000 years old from the holes drilled through the coral. Need 10,000-foot hole to reach basement rock.

➤ BIKINI atoll has been a-building for more than 20,000,000 years. That much can be stated on the basis of the deep holes drilled there last summer. How much older this submerged mountain of coral may be cannot be determined until a far deeper hole—perhaps 10,000 feet—is bored, reaching to the still-unknown basement rock beneath the coral.

In the journal, *Science,* (Jan. 16), Dr. H. S. Ladd and J. I. Tracey of the U. S. Geological Survey and G. G. Lill of the Office of Naval Research tell of the five holes bored on the atoll to find out what it is made of. To the bottom of the deepest one—2,556 feet—it was all coral, mostly rather loose and soft. Earlier records made by seismographs indicate that much farther down, at depths between 6,000 and 13,000 feet, the solid basement rock begins. This is presumably basalt.

The top few hundred feet as shown by samples taken with core drills, is geologically recent—that is, it does not go as far back as the beginning of the latest Ice Age, a million years or so ago. Pre-Ice-Age fossils belonging to the Tertiary epoch were found at 930 feet.

From 1,790 feet to as far down as the drill went, the limestone was definitely of early Miocene age, which puts it well down into the Tertiary. Years do not mean much here; a good guess is about 20 millions.

The cylindrical limestone samples brought up by the core drills have all been deposited with the National Museum in Washington.

Dr. Ladd and his associates express the hope that a 10,000-foot hole may be drilled in the middle of Bikini lagoon, to reach basement rock. They propose to sink a barge onto the top of a coral pinnacle in the lagoon, for use as a working platform for the drilling apparatus.

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NUCLEAR PHYSICS

Man Is More Vulnerable Than "Bugs" to Radiation

➤ "BUGS" will have a better chance to survive than man in an atomic war.

This was pointed out by Dr. Douglas M. Whitaker, dean of the Stanford School of Biological Sciences, who last summer was a member of a scientific expedition to Bikini Atoll.

Dr. Whitaker stated that bacteria and lower forms of plant and animal life tolerate vastly greater quantities of radiation than man.

"If man should eliminate himself from the earth, which is highly unlikely," he continued, "these lower forms may still be expected to persist on earth."

Radiation damage to cellular tissue, whether it be that of plants or animals, is closely tied to the process of growth, Dr. Whitaker stated.

"The bodies of plants and animals, including man, are composed of microscopic units called cells. Growth takes place when these cells increase their number by division.

"When cells are in the act of dividing, they are much more easily damaged by an adverse influence, including penetrating radiation, and for this reason we find that atomic radiation selectively damages those tissues of the body which are undergoing rapid cell division.

"This includes developing embryos, the germ cells in testes or ovaries, and blood cells—both red and white.

"Accordingly, abnormal embryos may be produced, and in the adult body, sterility, anemia, and inability to combat diseases due to lack of white blood cells commonly result from irradiation.

"If the dosage is small, recovery will be complete, but death results from large doses."

Dr. Whitaker also noted that the disfiguring scars characteristic of radiation burns are due to the fact that heat from atomic radiation cooks the skin or the entire body at close range.

"Even more important, however, than these damages to the individual are the hereditary changes, known as mutations, that are induced by radiation in the nuclei of cells," he continued.

"Mutations in spermatozoa or eggs are passed on to succeeding generations, and the vast majority are of a sort to cause damage and abnormalities.

"Most of them, however, will not appear until the second or third succeeding generation."

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ASTRONOMY

First Comet of 1948 Has Been Discovered

➤ THE first comet of 1948 has been discovered. A faint new one, it was spotted in the constellation of Hercules.

Of the tenth magnitude and thus far too faint to be seen with the naked eye or binoculars, the comet has a noticeable tail. It is heading northeast.

Comet "1948 a" will be known as Comet Mrkos after its European discoverer, Antonin Mrkos. It was spotted at 4:40 a.m. Greenwich Civil Time on Jan. 18, or shortly before midnight Eastern Standard Time, Jan. 17, according to Dr. Antonin Becvar, director of the Astrophysical Observatory at Skaluate Pleso, Czechoslovakia, who himself discovered a new comet last year. Its discovery was announced in a cablegram from Miss J. M. Vinter Hansen of Copenhagen University Observatory, to Harvard College Observatory, clearinghouse for astronomical information in the Western Hemisphere.

When found the comet's right ascension was 16 hours, 41.8 minutes, its declination plus nine degrees, 45 minutes. Its daily motion is plus three minutes 32 seconds in right ascension, plus 28 minutes in declination.

Science News Letter, January 31, 1948

PHYSICS

Miniature Geiger Counter Designed for Close Work

➤ A GEIGER counter with a tube only one inch long and less than that in outside diameter has been designed by Drs. Nello Pace, Robert Loevinger and Enrique Strajman of the University of California. It is designed for measuring radioactivity from single organs, or even parts of large organs, in man and the larger animals.

Details of its construction and use are given in the journal, *Science*, (Jan 16).

Science News Letter, January 31, 1948

ORTHOPEDICS

Hip Bone Yields Better Grafts Than Leg Bone

➤ BONE grafts taken from the hip, or iliac, bone make better grafts than those taken from a leg bone, Dr. I. S. McReynolds of Houston, Tex., declared at the meeting of the American Academy of Orthopedic Surgeons in Chicago.

"Iliac bone is meshy and porous and thus allows better contact with the body fluids which nourish the transplanted bone," he explained. "This meshy type of bone contains large numbers of bone-forming cells and when used as small chip grafts some of the transplanted chips survive immediately, begin to grow, and form new bone."

Grafts from hip bones are less liable to infection, he added.

Fewer serious complications occurred when grafts were taken from the hip than when taken from the leg bone. Frequently the leg bone, from which a graft has been taken, breaks, Dr. McReynolds said.

In one study during the war iliac bone was used in 65 operations over a four-year period with only three known failures of the iliac bone grafts.

Science News Letter, January 31, 1948

ANTHROPOLOGY

World's Most Valuable Fossils Shown in New York

➤ THE world's most valuable collection of early human and pre-human remains has been opened to the public at the American Museum of Natural History in New York. It consists of fossils representing a giant ape-man, *Gigantopithecus,* a half-million-year-old giant who was undoubtedly human, *Meganthropus,* and an ordinary-sized human being only a quarter of a million years old, *Homo soloensis.* With them, for comparison, is the skull of a primitive Australian bushman.

The priceless fossils were all found in Java shortly before the war by a German-born citizen of the Netherlands, Dr. G. H. R. von Koenigswald. After enduring Japanese captivity until after VJ day, he brought his rescued treasures to this country a little over a year ago. At the end of their showing in New York, they will be taken to the Netherlands, since they are all the property of that country's government.

The *Homo soloensis* skull has been given the nickname of "Hirohito's birthday present" because it was taken to Japan during the war, found in the Emperor's palace by a young American officer, and brought back to this country to rejoin its "family." This human species is regarded as an Asiatic cousin of *Homo neandertalensis,* the famous Neandertal man of Europe.

In all, 11 of these Solo skulls were found, in the valley of the Solo river, all in one place. No skeletal bones were found, and all the skulls had holes in them. It looks like the world's number one "whodunit."

Science News Letter, January 31, 1948

IN SCIENCE

BACTERIOLOGY

Bacteria, Fungus Spores, Caught in High Arctic Air

➤ FRESH evidence that bacteria and the spores of fungi are carried by high-altitude winds in Arctic regions has been obtained by three McGill University biologists, Prof. Nicholas Polunin, Prof. S. M. Pady and Prof. C. D. Kelly of Montreal. Sticky-coated glass plates and microscope slides were held out of the window of a plane flying at 5,000 feet at regular intervals during a flight from Victoria Island, off the Arctic coast of Canada, to Edmonton, Alberta. Subsequent growth of the bacteria, and germination of the spores, proved them to be alive.

The only previous high-altitude germ collection of this kind made in the Arctic was a series taken by Col. C. A Lindbergh over Greenland in 1933. Unfortunately, the results of this earlier collection were never fully evaluated, because the biologist who had undertaken to do so, Dr. Fred C. Meier of the U. S. Department of Agriculture, lost his life in an air crash before he could complete the work.

The three McGill scientists announce preliminary results in the British journal, *Nature* (Dec. 20, 1947), and state that details will be published elsewhere at a later date.

Science News Letter, January 31, 1948

CHEMISTRY

Chemical Test for 2,4-D Gives Wine-Purple Color

➤ A NEW chemical test for the presence of the weed-killer, 2,4-D, in extremely small amounts has been developed by Prof. Virgil H. Freed of the Oregon Agricultural Experiment Station.

The material suspected of carrying the plant poison is first thoroughly dried in a test tube. A few crystals of chromotropic acid are placed with it, then a small amount of concentrated sulfuric acid.

The tube is then heated carefully for about two minutes. If 2,4-D or one of its close chemical relatives is present, the liquid changes color to pink or wine-purple.

Science News Letter, January 31, 1948

E FIELDS

MEDICINE

Night Attacks of Asthma Relieved with New Drug

➤ A NEW synthetic drug which holds promise of relieving the night suffering of asthma-afflicted persons is reported by Dr. Milton M. Hartman of San Francisco in the *Annals of Allergy* (Nov.-Dec. 1947).

Of 60 patients treated with the drug known as compound No. 887, approximately 80%, with a moderately severe form of the disease, "benefited from the use of the drug," according to Dr. Hartman.

It was not possible to get complete relief of asthma attacks in all of these patients because the drug produced a feeling of "dopiness" in the patients when given in too large doses. The ideal dose, declared Dr. Hartman, is from 0.1 gram to 0.2 gram every four hours.

The sedative effect of the drug somewhat limits its usefulness during the day but makes it good to take before going to bed. Its sedative effect and its ability to check wheezing, shortness of breath and coughing enables the patient to get a good night's sleep.

The chemical name for this drug is beta-diethylaminoethyl 9,10-dihydroanthracene-9-carboxylate hydrochloride.

Science News Letter, January 31, 1948

CHEMISTRY—ORDNANCE

Poison Gas Rockets Predicted for Next War

➤ POISON gas, rather than atom bombs, may be in the long-range rockets that will descend on American cities if that much-discussed next war materializes, Col. Ludlow King, president of the Chemical Corps Association, suggests in the *Chemical Corps Journal* (Jan.).

Poison gases, he declares, "are from a very objective and realistic point of view, perhaps the most inexpensive casualty producer presently known. The cost of the two atomic bombs dropped on Japan could procure sufficient toxic gas to bring complete devastation to the populaces of a thousand cities the size of Hiroshima."

The Nazis did not use poison gases during World War II because they are obsolete, as many persons now think, but because they knew that we were prepared to retaliate in kind, many times over, Col. King declares. But for this deterring consideration, the Germans could have mined with gas the inundated areas over which our troops had to pass in the Normandy landings, and spread a thin film of liquid gas over the water, multiplying our casualties a thousandfold.

In the same issue, an unsigned article states that the Japanese were well armed with poison gases during the war, but that they deliberately deprived their troops of chances to use them because of fear of American reprisals.

Science News Letter, January 31, 1948

ENGINEERING

New Slope-Design Features Lessen Danger of Slides

➤ MODERN engineering, based on laboratory studies, greatly lessens danger from slides of the earth banks of shipping canals, the American Society of Civil Engineers was told at its meeting in New York. The discussion centered around present proposals to replace the Panama canal with a sea-level structure.

Special slope-design treatment can produce slopes which not only would be stable under static loading, but which would resist dynamic forces so effectively that large explosions would not be expected to close even the deep sea-level Panama canal if constructed.

Apparatus developed and tests performed to investigate the strength of soils and soft rocks under dynamic loads were described by Dr. Arthur Casagrande and W. L. Shannon, of Harvard University, who have recently conducted tests of strength of soils under contract with the special engineering committee of the Panama canal.

The proposed sea-level canal would be virtually indestructible, even by atomic bombing, Col. James H. Stratton, supervising engineer of the Panama canal special engineering division, told the group. It would cost close to $2,500,000,000, and would taken ten years to construct. But it would serve future needs of interoceanic commerce and national defense for many years to come.

"A sea-level canal at Panama constructed by the conversion of the existing lock canal could not be destroyed by the enemy," he declared. "Only the atomic bomb could cause significant interruption in service, and then for not more than a few weeks. Navigation would be practicable in the sea-level canal even though tidal currents were not regulated."

Science News Letter, January 31, 1948

MEDICINE

New Lead to Prevention of Diabetes Seen by Nobelist

➤ A NEW lead to the possible prevention of diabetes may come from recent rat experiments, Dr. Bernardo Houssay of Buenos Aires, co-winner of a 1947 Nobel Prize, declared in a lecture at the University of California.

When the pancreas, gland which produces insulin, is removed, two or three months elapse before diabetes develops in the rats, Dr. Houssay reported. During this time the animal's blood sugar is normal.

The two to three month period is equal to several years in the human life span. And there is a possibility, Dr. Houssay thinks, that the same pre-diabetic period without symptoms exists in man.

"If it does occur," he said, "it gives a great advantage for diagnosing the condition and so preventing the progress of the disease by maintaining or increasing the functional capacity of the degenerating pancreas. Studies in this direction might be of extraordinary importance in the prevention of diabetes."

Science News Letter, January 31, 1948

AGRICULTURE

Plant Disease Forecasting New Government Service

➤ FORECASTING the spread of plant diseases, so that farmers may prepare for preventive spraying, is the newest service to be undertaken by the U. S. Department of Agriculture. An experimental program will be carried out this year at three regional centers, whose data will be forwarded to the Department's laboratories at Beltsville, Md., for coordination.

The regional reporting centers will be at Ames, Iowa, serving a great triangle of states from the Dakotas to Michigan to Missouri; at Newark, Del., serving states from Ohio to Maryland to New England; and at Raleigh, N. C., covering the 13 states of the South, from Kentucky to the Gulf and from Texas to Virginia.

Observations this season will be made on late blight of potatoes and tomatoes, blue mold of tobacco, and downy mildew of cucumbers, squashes, pumpkins and melons. Relations between occurrence and spread of these diseases and weather and other environmental factors will be studied.

Science News Letter, January 31, 1948

ASTRONOMY

Planets Illuminate Sky

Venus, Mars and Saturn will add to the brilliance of February evenings. Mercury will be seen at dusk and Jupiter will ascend a couple of hours before sunrise.

By JAMES STOKLEY

➤ BY the time February evenings are with us, the skies shine with their full winter splendor, but this year the addition of three bright planets—Venus, Mars and Saturn—makes them even more brilliant. The brightest is Venus, which sets a little too early to be shown on the accompanying maps. These show the appearance of the heavens about 10:00 o'clock on the evening of Feb. 1, and an hour earlier at the middle of the month. However, an hour before these times, Venus is easily located in the west, in the constellation of Pisces, the fishes, just below Aries, the ram, which is shown. Considerably brighter than any other star or planet, one need have no doubt of its identity.

The other two planets are to the east, both in Leo, the lion. Mars is alongside of Regulus, though considerably brighter. The magnitude of Mars is at a maximum this month (minus 1 on the astronomer's scale). Among the stars only Sirius, the dog-star, exceeds it in brightness, by about one and three-quarter times. Saturn, a little to the right of Mars, is of magnitude 0.2, which makes it about a third as bright as Mars.

Glimpse of Mercury

In addition, Mercury will be glimpsed early in the month. On Feb. 4 it is farthest east of the sun and for a few days around then it will be seen low in the southwest as the sky darkens. It will be lower than Venus. The last of the five naked-eye planets—Jupiter—is in the constellation of Sagittarius, the archer, and rises in the southeast a couple of hours before sunrise.

Among the stars (which, unlike the planets, are distant suns, shining with their own light) Sirius is the brightest, as noted above. This is low in the south, in Canis Major, the great dog. Above and to the right of this figure one sees Orion, the warrior. In this are two first magnitude stars: Betelgeuse, above, and Rigel, below. Between these are three fainter stars which form an easily recognized row that marks Orion's belt. Still higher, and farther west, we come to Taurus, the bull, with red Aldebaran to mark his eye. In the bull's shoulder, farther to the right, are the Pleiades, a famous loose cluster of faint stars.

Directly overhead, at the time of the maps, is Auriga, the charioteer, with first magnitude Capella. Next to this group, in the direction toward Leo, are the twins, Gemini. Pollux is of the first magnitude while the other twin, Castor, is a little fainter. Below Gemini is Canis Minor, the lesser dog, in which Procyon shines.

Big Dipper in Northeast

In the northern sky the big dipper, part of the great bear, Ursa Major, hangs in the northeast, with the dipper's handle downwards. The two stars at the top are the pointers, showing the direction of Polaris, the pole star, in Ursa Minor, directly north. On the other side of the pole star is Cassiopeia, the queen, a group of stars like a letter W on one side.

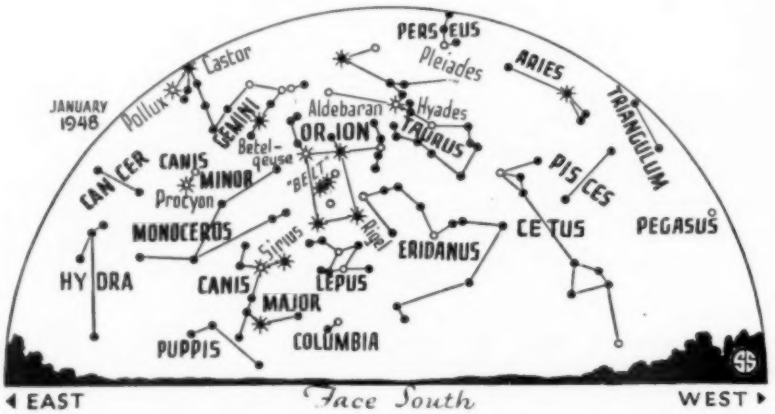
Since the earth and the other planets revolve around the sun in approximately the same plane, we sometimes see these others in the same direction as the sun. Venus and Mercury, which move in orbits smaller than that of the earth, can never get to a position where they appear opposite in the sky to the sun. But the outermost planets—Mars, Jupiter and Saturn—can do so. The technical term for this is opposition, and it happens that both Mars and Saturn are in that position this month, the former on Feb. 17 and the latter on the 8th.

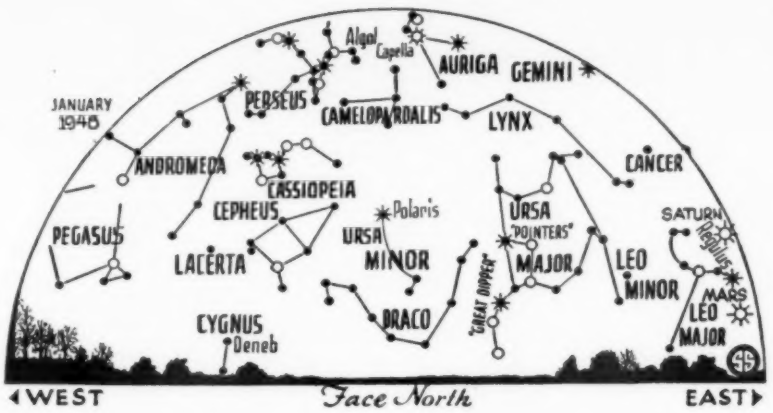
At opposition these planets are nearest, for they are only as far from us as the difference between their distance from the sun and that of the earth. When they are in the sun's direction (called conjunction) they are at a distance from us equal to the sum of these figures. When Saturn is at opposition on Feb. 8, at 9:00 p.m., it is 761,610,000 miles away, quite far, but it must be remembered that Saturn is the farthest of the naked-eye planets.

The orbit of Saturn is nearly circular, but that of Mars is more eccentric, i.e., more stretched out into an ellipse. Its mean distance from the sun is 141,690,000 miles, but once in the 687 of our days which it takes to go around its orbit, it comes as close to the sun as 128,690,000 miles, and at another time it is 26,000,000 miles farther, or 154,690,000 miles. The earth's orbit is much more circular than this, so at some oppositions Mars is considerably closer than at others. On March 5, Mars will be at aphelion (farthest from the sun). Opposition occurs only a couple of weeks before, so the two planets will be 63,020,000 miles apart, even when closest together.

The Red Planet Mars

In striking contrast was the opposition of Aug. 22, 1924, when Mars was nearly at perihelion (closest to the sun), and it was only 35,000,000 miles from us, only about 400,000 miles more than the very minimum possible. Not for centuries will we again be as close, but on Sept.





11, 1956, Mars will be only 35,400,000 miles away. By that time powerful new telescopes, such as the 200-inch at Mt. Palomar, which will start operation this year, and the 120-inch of the Lick Observatory, now planned, will be in operation. New electronic observing techniques, now under development, may well by then have been perfected, further augmenting our telescopic powers, and the solutions to many problems concerning this red planet may finally be given.

One of the chief of these concerns the so-called "canals," curious straight markings on its surface which some expert observers with the largest telescopes never could see, while others have reported seeing them plainly with smaller instruments. They are best observed with the eye at the telescope. Some photographs seem to show them, but not clearly, for they are just at the limit of what can be recorded in this way.

The trouble is that the air through which we have to point our telescopes is continually in motion, and this bends the light rays and blurs the image. Occasionally, perhaps only for a fraction of a second, conditions may become very steady and the visual observer can get a glimpse of very fine detail. Since, in the past, photographic exposures have been at least several seconds, they were always somewhat blurred. The tremendous light-gathering power of the 200-inch telescope may make it possible to take very short exposures which will catch the instants of "good seeing." This will involve taking hundreds or even thousands of pictures, one after the other, and then studying them to see which is the best. No doubt such a program will be carried out in 1956 at Mt. Palomar, and also, perhaps, about June 25, 1954, when Mars will be a little more than 40,000,000 miles away.

Time Table for February

Feb.	EST	
1	7:31 p. m.	Moon in last quarter
4	11:00 a. m.	Mercury farthest east of sun, visible for a few days in west in early evening
5	1:08 a. m.	Moon passes Jupiter
8	9:00 p. m.	Saturn opposite sun and nearest earth, distance 761,610,000 miles
	10:02 p. m.	New moon
9	1:00 a. m.	Moon farthest, distance 252,670 miles
11	1:07 a. m.	Moon passes Mercury
13	7:03 a. m.	Moon passes Venus
17	11:00 a. m.	Mars opposite sun and nearest earth, distance 63,020,000 miles
	8:55 p. m.	Moon in first quarter
19	10:00 p. m.	Mercury between earth and sun
23	7:45 a. m.	Moon passes Saturn
	7:00 p. m.	Moon nearest, distance 222,130 miles
	8:51 p. m.	Moon passes Mars
24	10:10 p. m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, January 31, 1948

WILDLIFE

Bison Near Extinction

► THE European bison, or wisent, close cousin to the North American bison, has been pushed to the edge of extinction by two world wars, reports Richard Glover of the University of Manitoba. Most recent available figures show a total of exactly 97 pure-bred specimens, 48 of them males and 49 females. Fifty of the animals are in Poland and the USSR; the rest are divided among Germany, the Netherlands, Sweden and Switzerland. If there is to be a comeback of the species, it is from these animals that the new stock must be bred.

Since the wisent crosses readily with both American bison and domestic cattle, there are a good many hybrids in various European countries. These, however, will be rigidly excluded from the comeback effort. Unfortunately, a well-tended herd in England, owned by the Duke of Bedford, is not quite purebred—there is a little more than three percent of domestic cattle blood in the strain.

The wisent is a taller, longer-bodied animal than its American cousin, states Mr. Glover. It is higher in the hindquarters and not so thick in the body. He regards the wisent as much superior to the American bison.

Wisent are naturally forest animals, requiring food elements obtained by browsing on twigs and bark of shrubs and trees for best health. They do, however, eat some grass.

Before World War I there was a large herd in the Caucasus region, comprising well over a thousand head. There was a smaller herd, of possibly 200 animals, in a forest preserve in Poland. Besides these, there were smaller groups elsewhere in Europe, principally in zoos. During the period of confusion and want after 1918, all the animals in the Caucasus herd were killed for food by the natives of the region. The herd in Poland survived, but World War II resulted in the disappearance of most of its specimens. Now the rehabilitation of the species must be attempted with the 97 known pure-blooded animals.

In prehistoric times the wisent was abundant and widely distributed over Europe and parts of Asia. Its pictures were accurately drawn by Cro-Magnon artists in the caves of France and Spain. It figures in very early Mesopotamian art, and was probably the prototype of the great winged bulls of Assyria, long after it had disappeared from that part of the world.

During the Middle Ages and early modern times, hunting and the spread of cultivation steadily diminished its numbers and drove the survivors eastward. Then the staggering blows of two world wars have all but finished it off.

Science News Letter, January 31, 1948

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Do You Know?

Chlordane is a fast-acting insecticide for Japanese beetle grubs.

America will need more *vegetables* this year to make up for a smaller supply of other foods.

Fire loss in the United States during the past year was greater than in any previous year.

Two *tree* varieties in Florida, that grow wild nowhere else in the world, are Florida yew and Torreya or savin.

Sheep, unless otherwise well-fed, will severely damage longleaf pine seedlings up to four feet in height if pastured among them.

By adding a pinch of metallic *cadmium* to the mercury in the quartz inner bulb of a new lamp, red and other new colors are added to the light.

MEDICINE

Check Bleeding Agent

➤ A CHEMICAL extracted from logwood trees and another which is a blood constituent might prove helpful in treating atomic radiation sickness and certain blood disorders, it appears from studies reported by Drs. E. J. Mackowiak and R. D. Barnard in the *Journal of the American Pharmaceutical Association* (Dec., 1947).

The studies were reported from the Veterans Administration Hospital, Batavia, N. Y., and the Terrace Heights Hospital, Hollis, Long Island.

The chemicals were studied in a search for substances to counteract the effects of heparin. Heparin is an anti-blood clotting agent used in treating some disorders, but too much heparin may result in uncontrollable bleeding. Increased production of heparin in the body has recently been considered a cause of the bleeding tendency in certain blood disorders and also in radiation injury, such as that following atomic bomb explosions.

A dye, toluidine blue, had previously been reported by other investigators to be an effective anti-heparin agent, and the pharmacologists confirmed this.

The blood constituent, modified human globin, which they studied was good too, but was slow in its action, taking about 12 hours. This might be offset, the scientists pointed out, by its relatively low toxicity and future ready availability through the national blood program established by the American Red Cross.

The logwood tree extract, hematoxylin, is as effective as the dye for concentrations of heparin up to 2%. For higher concentrations of heparin, the action of hematoxylin becomes complicated by a marked precipitation of plasma proteins.

Science News Letter, January 31, 1948

You will enjoy this new "wonder book" of lakes

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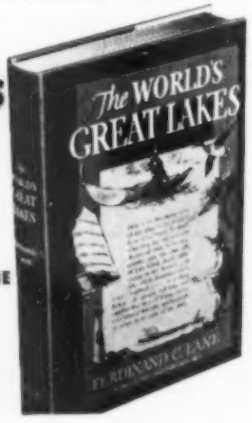


MEDICINE

Rh Danger in Transfusions

➤ A WARNING of Rh danger in blood transfusions to women and even to very little girls who some day may be mothers is given by Drs. L. M. Hellman and G. J. Vosburgh of the Johns Hopkins Medical School and Hospital in the *Journal of the American Medical Association* (Jan. 10).

The danger is that Rh negative women and little girls may be sensitized through transfusions with Rh positive blood. Then, if they marry Rh positive men, their babies will be born with the severest form of erythroblastosis and usually will not survive.

Rh negative women who have babies by Rh positive fathers become sensitized by the Rh positive blood of their own babies. But this sensitization proceeds rather slowly and the first and often the second child born under such circumstances will be spared.

Transfusion with Rh positive blood is much more powerful in sensitizing the Rh negative woman than repeated bearing of Rh positive children, the Hopkins doctors declare. Even a small amount of blood at an early age may be dangerous. As an example of this they cite the case of a 22-year-old woman whose first baby was jaundiced five hours after birth because of anti-Rh positive substances in his mother's blood. The anti-Rh substances developed as a result of transfusion of about five ounces of blood when the young mother was herself a two-months-old baby with dysentery.

The danger can be averted, the doctors point out, by testing for Rh factor every time a woman of childbearing age or a female child is given a blood transfusion. In their opinion, a "high degree of negligence may be charged" if such tests are not made. In cases of dire emergency when there is not time to test the patient's blood, only Rh negative blood should be given.

Cases of erythroblastosis have been increasing in recent years and blood transfusions have also become more frequent in the same period. At Johns Hopkins Hospital 1,100 transfusions were given in 1939 compared with 5,585 in 1946. This is a five-fold increase. In 1937 there was one case of erythroblastosis for every 1,732 childbirths, while in 1946 the ratio had risen to one case in every 348 childbirths. Since the percentage of Rh negativeness in the population is fixed, the increase must be due to an increase in the number of women sensitized to Rh positive blood. The increase in transfusions, the doctors believe, accounts for this.

Science News Letter, January 31, 1948

AERONAUTICS

Suction Slots for Wings

This new type of wing for airplanes was proposed to draw away a part of the boundary layer of air. It is still in the experimental stage.

➤ A PROPOSED new type of wing for airplanes with a slot through which part of the boundary layer of air is drawn away was described in the annual Wright Brothers Lecture by Dr. Sydney Goldstein of the University of Manchester, England, who is also the chairman of the British Aeronautical Research Council. The lecture was under the sponsorship of the American Institute of the Aeronautical Sciences.

The wing is designated as a suction airfoil. It is in an experimental stage but is promising. Pulling away part of the air in the so-called boundary layer next to the surface of the wing is a method to control the flow of this layer and delay the drag and other harmful effects when the smooth or laminar flow breaks into a turbulent flow. This breaking means a boundary layer separation from the surface of the wing; it is desirable to prevent the separation until the flow of air reaches the trailing edge of the wing.

"The story I am about to tell in this lecture is still incomplete," Dr. Goldstein said. "It is largely the story of researches carried out in Great Britain arising from an idea due to Dr. A. A. Griffith. The idea is at once very general and very simple." When a fluid flows along an immersed solid surface at sufficient speed, a boundary layer is formed. If the flow of the boundary layer can not be controlled, harmful results may follow. Removing part of the boundary layer by suction is an attempt to avoid these harmful effects.

To use the suction principle, the wing must be especially designed. How much of the boundary layer air needs to be removed is as yet undetermined. When the method of design was satisfactory, the English scientist stated, the separation was avoided by sucking away less than half. The suction may be effected by use of a ducted fan, or the air may be taken through wing slots to the intake of the turbo-jet engine. The amount of air removed in the latter case would depend upon the amount needed by the engine.

"In assessing the probable performance of a suction wing, the state of the boundary layer (turbulent or laminar) at the slot through which part of it is sucked away is of great importance," he explained.

"In considering the principles of the design of low-drag aerofoils, we saw that we should like the velocity outside the boundary layer to rise to a position as far back along the wing as possible; but that we are hindered by the danger of turbulent separation if the rate of velocity decrease at the back of the aerofoil is too great. The danger increases, roughly, when the thickness of the aerofoil increases and when the position of maximum suction is moved further back."

"If, however, the whole of the pressure recovery, or velocity decrease, is concentrated over a very narrow interval along the chord, over which the boundary layer, or as much of it as necessary, is sucked away to stop separation, all danger of separation is avoided, and we can have a favorable velocity gradient over the whole of the rest of the chord."

"In spite of the work which has been done, it is clear that much is yet unknown about suction wings," he declared. The greatest gains will be obtained by application to the flying wing type of aircraft, and "it becomes feasible to design a much smaller flying wing than otherwise would be the case."

Science News Letter, January 31, 1948

PHYSICS

Popular Radio Program Features Dots, Dashes

➤ A RADIO program that consists essentially of ticks, dots, dashes and a musical note is faithfully followed by tens of thousands of enthusiastic listeners.

Jewelers and navigators, school teachers and musicians, radio hams and power companies all get vital information from these coded broadcasts, issued continuously night and day.

You can get the correct time by listening to these signals. Time announcements are given at five-minute intervals in International Morse Code. These signals are being advanced one minute so that in the future the audio frequencies will be interrupted for a minute precisely on the 59th minute, on four minutes past the hour, nine minutes past and so on.

A faint tick heard at intervals of precisely one second over station WWV of the National Bureau of Standards provides a useful standard time interval.

Musicians use the broadcast to tune their instruments. The standard of musical pitch, A above middle C, is broadcast for four minutes and interrupted for one minute.

The National Bureau of Standards' station provides six important technical broadcast services to the nation and five to the world. They are: 1. standard radio frequencies, 2. time announcements, 3. standard time intervals, 4. standard audio frequencies, 5. standard musical pitch, and 6. radio propagation disturbance warning notices. The bureau's broadcast offers the only such service being provided by any country.

Station WWV can be heard on the following frequencies: 2.5, 5, 10, 15, 20, 25, 30 and 35 megacycles.

Science News Letter, January 31, 1948

CHEMISTRY

Test Developed To Detect Minute Traces of Arsenic

➤ HERE'S one for the whodunit fans: University of Pennsylvania chemists have developed a simple, quick test for "microscopic traces" of arsenic in foods. As little as one thirty-thousandth of a pound of the poisonous metal can be detected, even in the presence of lead, tin and some other metals that interfere with conventional tests.

The test was reported by James H. Freeman and Prof. Wallace M. McNabb at the meeting of the American Chemical Society in Philadelphia.

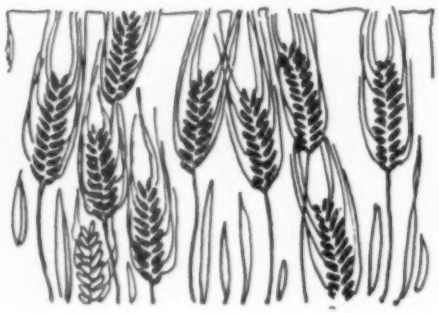
It is said also to have industrial applications, since a fraction of one percent of arsenic impurity, for example, seriously impairs the electrical conductivity of copper wire, and traces of arsenic can poison and destroy the effectiveness of platinum catalysts used to stimulate many vital chemical reactions.

The test can be completed within 45 to 50 minutes. It involves acidifying the suspected material, heating it with sodium hypophosphite, dissolving in a solution of potassium bromide and bromate, and finally adding potassium iodide. The amount of iodine freed by this procedure gives an accurate indication of the arsenic content of the sample.

Science News Letter, January 31, 1948

GEOLOGY

NATURE RAMBLINGS by Frank Thone



Ice, the Soil-Maker

➤ SOILS of the earth's cooler lands were made to a major extent by the action of ice on rock. And since all food comes ultimately from the soil, it is fair to say that winter ice helped to make our bread.

Ice acts in many ways to break rock into stones, and then to grind the stones into the silts and sands that are the mineral basis of the soil. Of the entire complex story, we can select only one or two phases for brief examination.

We have of course all heard the story of the great Ice Age many times: how the outcreeping edges of the continental ice sheets acted as a gigantic combination rock mill, bulldozer and plow, to grind boulders to gravel and crunch gravel to fine soil; then how the vast outpourings of water caused by the melting of the ice carried, sorted and laid down the various types of soil where we find them today. It is a very dramatic story, and it happened long ago.

Less dramatic, but still in process wherever winter gets really cold, is the rock-breaking action of ice that takes place whenever water freezes, and again when ice thaws. It is slow, but it goes on year after year, until even the most stubborn of stones at last yields bread.

The power of ice to rend rock depends on its unique property of expanding, slightly but powerfully, just below freezing-point. Thus a thin film of water in a chance fissure in granite, or between layers of sandstone or shale, becomes a spreading wedge of irresistible force when it solidifies, and again as it warms up from sub-zero temperatures towards the thawing-point.

In regions where there are alternations of thawing and freezing at the beginning and end of winter, or even throughout the cold season, each decisive rise or fall in temperature means myriad silent rock-breaking pressures. Sometimes, indeed, they are not so silent, and you can hear an old rock split with a report like a cannon. But most of the work is done without thus proclaiming itself; incredibly slow but inevitably sure.

The greater part of this ice-weathering of rock occurs under thicker or thinner mantles of soil already formed by the same process; it is difficult to tell where bedrock ends and soil begins. But much rock-splitting also takes place on mountain slopes, and here the fragments sooner or later slide and roll into the stream-courses at the base, there to be tumbled and hammered against each other until the big boulders are ground into gravel and their silt-fine fragments are carried far downstream, to be built into sandbars or left on the flood-plains after spring freshets.

Science News Letter, January 31, 1948

METEOROLOGY

Hard To Control Weather

➤ DON'T expect scientists to control the weather when they are not able to harness the raging flood waters of the Mississippi River, a U. S. Weather Bureau meteorologist cautioned.

Dr. Harry Wexler, chief of the Weather Bureau's Special Scientific Services Division, explained that typical air currents from the poles or tropics which give us cold or hot weather are 4,500 times as large as the flow of the Mississippi under flood conditions.

"Since man cannot control the relatively sluggish, shallow Mississippi River during floods, even with the aid of natural and man-made river banks, it is not likely that man can control on a global scale the fast and deep rivers of the atmosphere which determine our weather," the scientist argued.

Dr. Wexler discussed weather control as a guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

"A typical current of polar or tropical air is 1,000 miles wide, 10 miles high, moving at an average speed of say 20 miles an hour.

"This means that 1,000,000,000,000 (one trillion) tons of air per hour is sweeping over certain places," Dr. Wexler said.

By contrast, he pointed out, the Mississippi's top flow during floods is only 225,000,000 tons per hour.

This gloomy picture of weather control on a global scale does not prevent doing something about the weather in a small, local area, however, the meteorologist said. Although rainmaking with dry-ice and other materials dropped on clouds from planes is a recent development, local weather control of different types has been successfully achieved in other ways for many years. One method is the burning of fuel to protect orchards.

Rainmaking is still in its early stages, Dr. Wexler cautioned. One of the big questions is how much rain can be produced by dry-ice bombardment of clouds. This may be answered by experiments now under way at the Clinton County Air Base in Ohio. The Weather Bureau is cooperating with the Air Force, Navy and the National Advisory Committee for Aeronautics in experiments to measure actual rain from clouds which have been showered with dry-ice and other materials.

Radar will be used to check up on when a cloud is changed from a non-precipitating to a precipitating one and the position of the plane dispensing the seeding agent.

Even local rainmaking may not solve the drought problem, a major threat to food production in a hungry world.

"Rain simply cannot be made in a current of air either too dry or too stable to produce clouds," the scientist explained.

Science News Letter, January 31, 1948

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Books of the Week

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ADVANCES IN MILITARY MEDICINE—Committee on Medical Research—*Little, Brown,* 900 p., 2 vol., illus., $12.50. The official story of the tremendously important research conducted during the war by the medical section of the Office of Scientific Research and Development. Much of it applies to civilian conditions as well as military.

ANGLER'S CHOICE: An Anthology of American Trout Fishing—Howard T. Walden II, ed.—*Macmillan,* 326 p., $3.75. A collection of stories and articles to delight the fisherman.

BIBLIOGRAPHY OF OHIO ARCHAEOLOGY—Richard G. Morgan and James H. Rodabaugh—*Ohio State Archaeological and Historical Society,* 189 p., paper, $2.50.

A CATALOGUE OF INSECTICIDES AND FUNGICIDES: Vol. 1, CHEMICAL INSECTICIDES—Donald E. H. Frear—*Chronica Botanica,* Annales Cryptogamici et Phytopathologici, Vol. VII, 203 p., paper, $6.50.

CHEMICAL ENGINEERING FUNDAMENTALS—Chalmer G. Kirkbride—*McGraw-Hill,* 419 p., illus., $5.00. A text for an introductory course.

CHEMISTRY EXPERIMENTS AND EXERCISES—Andrew J. Burdick and Joseph J. Dudleston—*Singer,* rev. ed., illus., paper, $1.04. A laboratory book with detachable pages intended for use with any text.

THE COWRIE SHELL MIAO OF KWEICHOW—Margaret Portia Mickey—*Peabody Museum,* Papers, Vol. 32, No. 1., 83 p., illus., paper, $2.50. The story of the daily life of a non-Chinese people living in a village in China.

THE DEFENSE OF WAKE—R. D. Heinl, Jr.—*Govt. Printing,* 75 p., illus., $1.25. Official account, factual but thrilling, of the Marines' defense of Wake, seagirt Alamo of the naval war in the Pacific.

ELECTRONICS FOR INDUSTRY—W. I. Bendz with assistance of C. A. Scarlott—*Wiley,* 501 p., illus., $5.00. A text for engineering students, it also includes much valuable reference material useful in practice.

FLORA HAWAIIENSIS: The New Illustrated Flora of the Hawaiian Islands—Otto Degener—*New York Botanical Garden,* 2d ed., looseleaf, illus., $3.50. Books 1 to 4 brought together in one volume.

THE FUNGI OF MANITOBA AND SASKATCHEWAN—G. R. Bisby and others—*National Research Council of Canada,* 189 p., illus., $3.50. Scientific information about some 2,761 species.

FURTHER STUDIES IN THE GENUS DODONAEA—Earl Edward Sherff—*Field Museum of Nat. History,* Botanical Series, Vol. 23, No. 6, 48 p., paper, 75 cents.

GRIERSON ON DOCUMENTARY — Forsyth Hardy, ed., with American notes by Richard Griffith and Mary Losey—*Harcourt, Brace,* 324 p., $3.75. Selections from the writings of a British film critic having to do with "documentary films" which term he is credited with originating.

HIGHER EDUCATION FOR AMERICAN DEMOCRACY: Vol. III, Organizing Higher Education—A Report of the President's Commission on Higher Education—*Govt. Printing,* 74 p., paper, 30 cents.

HOMES—Editors of Progressive Architecture—*Reinhold,* 190 p., illus., $5.00. A book for home builders and dreamers containing a wealth of photographs and plans.

HUMAN ANCESTRY: From a Genetical Point of View—R. Ruggles Gates—*Harvard University Press,* 422 p., illus., $7.50. An account of the development of the modern races of man from Pithecanthropus to date.

INFORMATION PLEASE ALMANAC 1948—John Kieran—*Doubleday,* 960 p., $2.00. A useful and up-to-the-minute book of facts. The science section is very small, limited to only eleven pages.

MICROMERITICS: The Technology of Fine Particles—J. M. DallaValle—*Pitman,* 2d ed., 555 p., illus., $8.50. Revised and greatly enlarged edition of a text devoted to the behavior of small particles including the submicroscopic.

NASKAPI LAW—Julius E. Lips—*American Philosophical Society,* Transactions, New Series, Vol. 37, Part 4. 111 p., $1.75. Law and order in a hunting society—the Lake St. John and Lake Mistassini bands. Of interest to anthropologists and legal historians.

NORTH AMERICAN SPECIES OF MYCENA—Alexander H. Smith—*University of Michigan Press,* Scientific Series, Vol. XVII, 521 p., illus., $6.00. A taxonomic revision of one of the larger genera of the gill fungi.

ORGANIC SYNTHESES: An Annual Publication of Satisfactory Methods for the Preparation of Organic Chemicals, Vol. 27—R. L. Shriner, ed.—*Wiley,* 121 p., $2.25. The work of a large number of contributors.

ORGANIZING SCIENTIFIC RESEARCH FOR WAR: The Administrative History of the Office of Scientific Research and Development—Irvin Stewart—*Little, Brown,* 358 p., $5.00. This volume of the series Science in World War II is an official account of the tremendous job of organization.

PLANNING YOUR FAMILY—Herbert Yahraes—*Public Affairs Committee,* Pamphlet, No. 136, 32 p., illus., paper, 20 cents. Contains bibliography for further reading.

A PRELIMINARY STUDY OF HAWAIIAN SPECIES OF THE GENUS RAUVOLFIA; ADDITIONS TO THE GENERA SCALESIA AND HIDALGOA—Earl Edward Sherff—*Field Museum of Nat. History,* Botanical Series, Vol. 23, No. 7, 15 p., paper, 25 cents.

PRIVATE ENTERPRISE OR GOVERNMENT IN MEDICINE—Louis Hopewell Bauer—*Thomas,* 201 p., $5.00. A controversial subject discussed by a member of the board of trustees of the American Medical Association and president of the Medical Society of the State of New York.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS, Vol. V, No. 1—C. Lipson and W. M. Murray, ed.—*Addison-Wesley Press,* 136 p., illus., $6.00.

REPORTS OF OFFICERS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1947—*Carnegie Corporation,* 81 p., paper, free from publisher: 522 Fifth Ave., New York, N. Y.

THE ROAD TO GOOD NUTRITION—Lydia J. Roberts—*Govt. Printing Office,* Children's Bureau Pub. No. 270, rev. ed., 51 p., 15 cents.

ROAD TO THE SEA: The Story of James B. Eads and the Mississippi River—Florence Dorsey—*Rinehart,* 340 p., illus., $4.00. The biography of the engineer who built the bridge bearing his name in St. Louis.

THE SIERRA NEVADA: The Range of Light—Roderick Peattie, ed.—*Vanguard,* 398 p., illus., $4.50. A beautifully illustrated book of material on one of the country's most attractive beauty spots written by a group of specialists.

SPI HANDBOOK—*Society of the Plastics Industry,* 451 p., illus., $7.50. A wealth of reference material for those making or using plastics.

THE TENNESSEE, Volume II: The New River, Civil War to TVA—Donald Davidson—*Rinehart,* 377 p., illus., $3.50. A history of one of America's great rivers including the development of Muscle Shoals. One of a series.

THE UNITED NATIONS—Herbert Vere Evatt—*Harvard University Press,* 154 p., $2.50. As viewed by Australia's Minister for External Affairs. The book is revised from the Oliver Wendell Holmes lectures given in 1947.

VEGETABLE GROWING—James Sheldon Shoemaker—*Wiley,* 506 p., illus., $4.50. A text which will also be useful to the home and professional gardener.

WHOM THE GODS LOVE: The Story of Evariste Galois—Leopold Infeld—*Whittlesey,* 323 p., illus., $3.50. The dramatic life story of an ardent lover of the republic in France who only after his death became known as a mathematician.

Science News Letter, January 31, 1948

AERONAUTICS

Rip-Stop Parachute Adds Safety to Plane Jumpers

➤ NEW fabric for parachutes, dubbed rip-stop material, adds safety in jumping from planes because of its strength and ability to stop tiny rips that sometimes occur in high-speed bail-outs before they spread to make the parachute useless.

Parachutes of the new fabric, which has been thoroughly tested in high jumps, will go into production this month and 5,000 will be made this year for use by the Department of the Navy. They will be made at the Naval Aircraft factory in Philadelphia.

The fabric is nylon. The rip-stop feature is heavy cross-threads at quarter-inch intervals. Tests show that this heavy thread will prevent a rupture in the fabric from extending into a long rip. The new fabric is light. With it 28-foot parachutes will weigh no more than the present 24-foot chutes, and can be packed in the same container. It also provides a slower rate of descent, about 20 feet per second as compared with 25 feet with ordinary parachutes.

Science News Letter, January 31, 1948

• New Machines and Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 399. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *ROLL-AWAY DOORS for kitchen cabinets, made of light-weight, interlocking plastic strips, slide up and out of the way at a touch. They operate somewhat similar to the window shade, are finished in various colors, and are easily cleaned with soap and water.*

Science News Letter, January 31, 1948

❁ *IMPROVED CAR WASHER is a waterproof mitten on the back of a rubber-like sponge into which water is conducted by a connection to a garden hose. The water, flowing steadily through the spaces within the sponge, rinses and washes the surface at the same time.*

Science News Letter, January 31, 1948

❁ *PLANETARIUM, for use in home or school, projects on ceiling or wall constellations including most stars visible to the naked eye. It is a box with 12 faces, with a light in the center, punched with holes to represent the stars. It operates on house current and makes one revolution every four minutes.*

Science News Letter, January 31, 1948

❁ *BRUSHING MACHINE, developed especially for cleaning oil, grease and dirt from automobile clutch plates, is semi-automatic in operation and greatly speeds the process. The plates drop onto a rotating turntable which carries them under powered revolving brushes.*

Science News Letter, January 31, 1948

❁ *BALL BEARINGS, for use where freedom from magnetic influences are necessary, are made of hardened beryl-*

lium-copper alloy, and are designed particularly for electrical, electronic, geophysical and other instruments. The smallest fully-ground non-magnetic ball bearing made is shown in the picture.

Science News Letter, January 31, 1948

❁ *ROPES OF BEADS for neckwear are made of cellulose acetate plastics of many colors which are permanent because the coloring is in the plastic itself. The beads do not chip, and will not break even when dropped on a hard floor.*

Science News Letter, January 31, 1948

❁ *"BLACKBOARDS" for home and schools are actually white, green, yellow or gray in color, being made of wood-fiber with a light-colored coating of vinylite plastic, sprayed on and baked. Special dark-colored dustless crayons are used with these boards.*

Science News Letter, January 31, 1948

❁ *PLASTIC TOY, shaped somewhat like a spool, rolls back to the child after being rolled away. It has inside its ornamental bulging center section a spring mechanism, wound up by the forward movement, which causes it to roll back.*

Science News Letter, January 31, 1948

Science Service Radio

➤ Listen to "Adventures in Science" with Watson Davis over Columbia Broadcasting System at 3:15 p.m. EST every Saturday afternoon.

Feb. 7—The Story Behind the National Blood Program—Dr. Ross McIntire, American Red Cross

Feb. 14.—Scientists of Tomorrow—Winners of the Science Talent Search

Feb. 21—Sounds from the Sun—Mr. Grote Reber, National Bureau of Standards

Feb. 28—National Meeting of Science Clubs of America, Broadcast from the Science Talent Search

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